

XXI.—Note on the Distribution and Nesting-habits of *Falco peregrinus pealei* Ridgway. By C. DE B. GREEN, Penticton, British Columbia.

WHERE do the ranges of *Falco peregrinus anatum* and *F. p. pealei* overlap? The latitude has not been decided yet. It is no doubt somewhere on the coast of Vancouver Island, possibly even south of lat. 49°, though probably north of lat. 50°.

In 1912 a young bird of *F. p. anatum* was secured in lat. 53°, but further search seems to prove that it was a wanderer.

Queen Charlotte Islands lie north of Vancouver Island, separated by Queen Charlotte Sound, sixty miles wide. The southerly island of Queen Charlotte group has not been examined, but birds shot at the north end of that island were undoubted *F. p. pealei*. Graham Island, which is separated by a channel only a mile wide from Moresby, has been carefully searched since 1910, and all birds breeding there are *F. p. pealei*. Two eyries at the south end belonged to birds of this race, and the north coast held fifteen eyries of *F. p. pealei* when examined in 1915.

The isolated Falcons at lonely points on the coast were living chiefly upon duck, chickens, and sandpipers, but the congregation of *F. p. pealei*—thirteen eyries at the north-west corner of the main island and on the rocky shores of Langara Island, just across Parry Passage—were living entirely upon the Ancient Murrelets (*Synthliboramphus antiquus*), which were breeding there in thousands.

The birds were fat and inactive while incubating, both birds staying at the eyrie during both laying and incubating. In only one case out of thirteen did the male fail to show up at the first sound of the gun, and in that case it seems possible that he had been commandeered at an eyrie a couple of miles away, where, three days before, I had shot the male, leaving the female in good condition to lay again, her set having just been completed; within forty hours she could be seen at the same eyrie with a fresh mate. In only

one other case was there a lone bird, the male, keeping watch on a tree near by, while, the day being unusually hot, the female was off for exercise nearly two hours, and could sometimes be seen wheeling high in the sky.

The birds nearly always choose the very top of the cliff under the roots of a spruce-tree growing on the edge—in some cases quite easy of access, sometimes requiring a rope and some help.

Nothing was found at any of the eyries but remains of Ancient Murrelets, very rarely anything but the heads, very neatly cut off and always fresh; all other remains were cleared away carefully.

Langara Island is about twenty miles in circumference, and has a pair of Falcons at a distance of every two miles apart; the whole island is a warren of Ancient Murrelets, and there are colonies of other sea-fowl at particular points and on adjacent islets, but the Ancient Murrelets predominate, and are killed by hundreds by the Falcons and by thousands by Indians, who visit the island from May to August and destroy the birds and eggs simply for food. Something in the flavour evidently pleases both the Falcons and the Indians, for neither of them seems to make war on the other fowl.

The eggs of the Ancient Murrelet, two in number, are not hard to dig out, being only about arm's length under ground, and, strange to say, the Crows go after them under ground far enough to find all they want. The Rhinoceros Auklet (*Cerorhinca monocerata*), however, is exceedingly hard to dig out, and is almost hopeless without a small dog to direct operations and keep the right track for the nearest nest in the labyrinth of tunnels they make amongst the spruce-roots.

The Marbled Murrelets (*Brachyramphus marmoratus*) do not pack like the Ancient Murrelets, but can be seen in pairs scattered all over Dixon Entrance; their nesting-habits are still in some doubt, but much enquiry amongst Indians leads to the belief that they fly to high mountains inland and burrow there, but whether in colonies or singly has

never been discovered. They do not mix with the Ancient Murrelets' colony on Langara Island.

Two interesting sights were seen while collecting Peale's Falcons. On April 20th there were no Puffins at the island ; a few days later there was a flight of them, perhaps 100, at their yearly haunt on a rocky hillside, and, being in the neighbouring bay all day, it was interesting to see what was apparently their method of gathering. They were increasing surely, not by flocks, but by single birds. They came at intervals of a few minutes from the Pacific Ocean—one at a time, never two,—and helped to swell the number steadily increasing at the breeding-ground. The other sight was a three days' constant stream of Shearwaters in an almost unbroken line past Langara Island, all heading from Dixon Entrance and disappearing to the north-west towards the Aleutian Islands. No doubt these are the migrating hosts, returning to spend their winter in our summer seas after breeding in the Antarctic.

Peale's Falcon lays, of course, four eggs, like its congener the Duck-Hawk ; the eggs are indistinguishable from those of the latter, being red to match the hollow of rotten wood amongst the débris of trees growing at the top or on the ledges of cliffs, at any elevation above the water-line from 20 to 500 feet. One clutch was found upon a grassy slope dividing a lower cliff from an upper one, but always amongst the roots of a spruce-tree, which gives shelter to the sitting bird in rainy weather. Only one eyrie was found differently situated, and that was on a ledge sheltered by an overhanging rock ; the nest had no red rotten wood, and, interesting to note, the eggs were the palest seen.

When the complete clutch is taken, before incubation begins, the bird begins her fresh set close by the first in about ten days, but if incubation has advanced it will be more like three weeks before the new set is laid. Whether the bird would make a third attempt to raise a brood, there was not time to discover. They must be accustomed to losing their broods, for the Indians have many superstitions about them—one being that the best way to bring a west

wind is to visit an eyrie and hurl the eggs or young to the west into the sea, and for an east wind to go to the other side of the island; and this is surer than hammering a line of holes in a granite boulder in the direction from which you want the wind to come—also, if an eyrie is close by, it is quicker.

April 10 to May 1 is the usual time for eggs; after that young are very likely to be found. No young had been hatched when the island was left on May 1, 1915.

XXII.—*The assumption of Summer Plumage in Pyromelana oryx.* By A. G. BUTLER, Ph.D., F.L.S., F.Z.S., M.B.O.U.

It has been definitely asserted by Mr. Jonathan Dwight, Junr., and others, that a feather when once perfected is incapable of colour-change and that the apparent change which takes place at the assumption of the summer plumage is due to the falling off or abrasion of the tips or fringes of the feathers. That this is the case in some species is certain; but it is equally certain that in many species there is an actual change of colour in the feathers themselves, as I pointed out in a short article which I sent to 'The Ibis' in 1897, where I described changes of plumage in *Quelea quelea* and *Pyromelana franciscana* and *P. afra*.

In Stark and Selater's 'Birds of South Africa,' vol. i. p. 131, the authors confirm my statement as to the gradual change of colour in the feathers themselves at the assumption of the summer plumage in the case of *Pyromelana capensis*. They say:—"Only the feathers of the lower back, rump and flanks are entirely changed by a moult, the remaining plumage and bill becoming darker, owing to a gradual absorption of colouring matter, the change first appearing at the point of the lower mandible."

As I have elsewhere pointed out, if the plumage of birds were incapable of change by absorption of colouring after it had attained its full growth, it would be impossible for the